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READING AND GRAMMAR LEARNING THROUGH MOBILE PHONES

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This paper describes an ongoing language-learning project, three years into its development. We examine both the feasibility and the limitations of developing English reading and grammar skills through the interface of mobile phones. Throughout the project, reading and grammar materials were regularly sent to students' mobile phones. Students read or took part in any aspect of the materials that appealed to them. Information gathered from participants and server logs indicate that reading and learning grammar using mobile devices is regarded as a positive language experience. However, the data also indicate that the success of any mobile learning project could be limited unless certain criteria are applied. This includes (a) providing engaging learning materials that are neither too long nor overly-demanding; (b) a proper degree of teacher monitoring; (c) student involvement; (d) the need for incentives; (e) a respect for privacy; and (f) a safe and secure mobile-learning technical environment.

Keywords: Mobile Phone, Language Learning, Reading, Grammar, Efficacy, Security and Privacy Concerns

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INTRODUCTION

Mobile Phones in Education

Japan has one of the world's most advanced cellular networks, and most of the student population there possesses a mobile phone. In part due to the ubiquity of Wi-Fi and WiMAX, smart phone users have become the norm rather than the exception. There are three main reasons for this trend. First, smart phones connecting to Wi-Fi or WiMAX have the same connectivity as computers. Even in the current 3G and 4G environment, the data processing capability of phones gives users far greater flexibility than ever before. The change is not just limited to the wireless environment; mobile phone hardware has seen exponential progress as well. Another reason for widespread smart phone use is that the screen size of some smart phones has increased to five inches or larger and the resolution has improved to around 1980*1080 pixels. Finally, the processing power of mobile phone CPUs also continues to evolve, and the memory cards on smart phones can store dozens of gigabytes of data, comparable with many PCs. It is clear that the gap in the operational functionalities between mobile phone and PC technology has narrowed, providing educators greater freedom for extending learning outside of traditional learning environments.

While some limitations for mobile phone use in education existed in the past (Wang & Higgins, 2006), these have begun to dissipate due to advances in information technology. For instance, the problem of small bandwidth has been remedied by the technologies of Wi-Fi, 3.5G, and 4G networks. Similarly, problems associated with manual text input are being resolved through the use of speech recognition technology, touch screens, and styluses. Since the emergence of smart phones in 2007, more and more functions specific to PCs and other hand-held devices have been integrated within mobile phone devices. In Japan, most mobile phones are now equipped with photo and video cameras, Quick Response (QR)

code readers, voice recorders, MP3/MP4 players and 1seg technology, which allows for mobile reception of terrestrial television, Global Positioning System (GPS), Internet access, email, Short Messaging Service (SMS) and Multimedia Messaging Service (MMS). Applications such as YouTube, Facebook, Skype, Twitter, Flash-embed or Java-enabled multimedia resources are all accessible on mobile phones. In sum: today's digital environment has blurred the differential between mobile phones and PCs.

As the price of smart phones continues to fall, they have ceased to be a tool of an elite minority. According to the MyNavi Co. Ltd. survey (2012), 59.3% of Japanese students currently possess smart phones. Whilst we cannot presuppose that such numbers will translate to a high number of mobile language learners, predictions for high future correlations do seem likely. For example, Cheon, Lee, Crooks, and Song (2012) indicate that college students in America are beginning to accept m-learning. Similarly, in Japan, a majority of Japanese students surveyed by Thornton and Houser (2005) preferred to receive learning materials on mobile phones rather than PCs.

Current pedagogical theory also shows a parallel enthusiasm for mobile learning. Situated Learning Theory (SLT) (Collins, Brown, & Newman, 1989; Warschauer, 1997) maintains that genuine learning is unintentional and situated within authentic activity, context, and culture. Discussing the effectiveness of Mobile Assisted Language Learning (MALL), Burston (2011) asserts that behaviorist, teacher-centered theories can complement and aid student-centered vocabulary and grammar mobile phone applications. Though it may be too early to judge the effectiveness of mobile phone learning, collaborative, learner-centered pedagogical approaches have undoubtedly informed and inspired developments in mobile learning programs.

Language Learning via Mobile Phones

Mobile phones are becoming more widely used in learning vocabulary, as is shown in a number of studies (Chen & Chung, 2008; Kennedy & Levy, 2008; Lu, 2008; Pincas, 2004; Stockwell, 2008; Stockwell, 2010; Thornton & Houser, 2005; Yamaguchi, 2005). In one study, Lu (2008) had students learn two sets of English vocabulary words either through mobile phones or by a paper-based format. Students who learned via SMS were found to understand more words than students presented with the paper-based tasks. Kennedy and Levy's (2008) research investigated the acceptability of a pushed mode of mobile phone operation; these authors sent short messages containing known words and new words mixed together. They found that the students appreciated the experience of reviewing learnt information and that the students found the message content often useful or enjoyable. Butgereit and Botha (2009) described a system that allows language teachers to create spelling lists or vocabulary lists in English and Afrikaans. The system then generates a fun mobile phone application using multiple texts-to-speech engines to encourage African pupils to practice spelling the words. Cavus and Ibrahim (2009) developed a system to send technical English language words together with the meanings in the form of SMSs.

Studies have also shown that MALL's utility is not just limited to vocabulary learning; mobile phones can also be applied to other learning situations. Comas-Quinn and Mardomingo (2009) carried out a mobile learning project to engage learners in the creation of an online resource that focuses on a foreign culture. In their project, students used their mobile phones, digital cameras, and MP3 recorders to select and record samples of their encounters with foreign cultures; students then sent or uploaded these encounters to a cultural blog to be shared with other group members. Chang and Hsu (2011) developed a system to integrate an instant translation mode, an instant translation annotation mode, and an instant multi-user shared translation annotation function to support a synchronously intensive reading course in the normal classroom. The project was designed for personal digital assistants (PDAs), not really for mobile phones. Demouy and Kukulska-Hulme (2010) also reported on a project that allowed students to use iPods and MP3 players, as well as mobile phones, to practice listening and speaking. They found that whilst the use of iPods and MP3 players was readily adopted by project participants, the process of doing activities on mobile phones was deemed less satisfying.

Despite the challenge of integrating phones into a learning environment, it has been shown that as users become more adept at using digital interfaces, their learning styles and how they perceive the learning material are both likely to change (Stockwell, 2010). Delivering smaller modular chunks—such as mini-essays and grammar quizzes—may be more suitable for better mobile phone learning experiences. Indeed, academics (Rutherford, 1987; Krashen, 1989) have long suggested that acquisition is enhanced when learnt in comprehensible, manageable pieces. With this in mind—and in order to address an absence of data on the development of reading and grammar skills via mobile phones—we initiated a trial in 2009, providing students with English reading and grammar learning materials in small modular chunks.

Purpose of the Study

Compared with mobile phone vocabulary learning and trial practices with listening and speaking, there is significantly less research on the advantages of mobile phone programs for reading and grammar practice. Waycott and Kukulska-Hulme (2003) reported that students found it difficult to read course materials on a PDA (a mobile device that is not popular with university students in Japan) and that it was generally considered to be inferior to reading in a paper-based format. Lan, Sung, and Chang (2007) explored the potential of mobile technology for reading, but their experiment was limited to tablet PCs and their participant pool only included elementary school students. The research of Huang and Lin (2011) shows that in terms of reading, receiving materials on paper is preferable to receiving resources via mobile phones or email regardless of the length of the texts. Whilst this is an important finding, the study only involved 10 students; furthermore, the study based its findings on the reading of just six texts.

In addition to the shortage of research into mobile reading and grammar learning, another important factor which inspired this project is the popularity of mobile phone novels in Japanese. Kawaharazuka and Takeuchi (2010) and Farrar (2009) reported that by 2007, five of the best-selling print novels in Japan were written and read on mobile phones. The prevalence for reading novels on phones was interpreted as a positive indication that students would look favorably on this current project if some of the protocols of writing novels were also adopted for the project. This included frequent use of the line return and the use of short sentences with few modifiers.

With these factors in mind we wanted to provide students with a learning opportunity that would help improve their English and allow us to have a better understanding of reading and grammar learning on mobile phones while also giving us the opportunity to assess the degree to which students are motivated to learn outside the classroom on their mobile phones. For these reasons we started a project called "Ubiquitous English" in 2009. To fully immerse students in a rich learning environment, short English essays and grammar quizzes were sent to students via their mobile phones two or three times a week. Students were then required to complete the activities on their mobile phones in their own time. During the course of our three-year project, several questions came up repeatedly and became a motivating force for the study. These questions include:

1. Are students prepared to read a foreign language and engage with grammar quizzes on their mobile phones? When students read on mobile phones, what kinds of topics motivate and what kinds of topics fail to captivate their interest?
2. When given the choice between accessing material on mobiles or PCs, which device will students instinctively use?
3. What general perception do students have towards reading and grammar on mobile phones?
4. What concerns do students have about learning languages using their mobile phones?

By addressing these questions, this paper aims to redress the gap in current research into mobile learning for reading and grammar practice as well as inform future research of important observations regarding this specific student population.

METHOD

The Development of Mobile Reading and Grammar Materials

The initial reading materials used within this project were developed by university teachers from the Center for Foreign Language Education, Shimane University, Japan. In order to enhance and extend the program, 10 advanced-level students were temporarily employed to write essays that were to be read by our students. These materials were uploaded by the students and later edited by university teachers. The task of writing short essays, however, was predominantly assigned to the native English-speaking teachers. At the outset of the project, it was agreed that each composition would be no more than 140 words in length, so that each essay could be read in two or three minutes on a small screen (Borau, Ullrich, Feng, & Shen, 2009; Grosseck & Holotesch, 2008).

In order to appeal to a majority of first-year students, whose average knowledge of English is at a pre-intermediate level, all the materials were written in simple and easy-to-understand English. Any words that we thought might cause a problem were annotated with Japanese translations. Vocabulary notes were placed at the beginning of the essay to make readers aware of new vocabulary items before they read the essay. Students could opt to click on the URL attached to the plain text essay and read the Japanese translation, although reading the translation before the essay was not encouraged.

There were a number of reasons we chose to use in-house materials in this project. Firstly, creating original reading and grammar materials avoids the ethical and legal issues related to copyright. Japanese copyright law (Chapter 2, Section 1) stipulates that a web page and all other related documents are copyright protected. Teachers may reproduce materials from web pages and use them in the classroom only if they do not "unreasonably prejudice" the copyright owner (Japan Copyright Office, 2011). In essence, this implies that teachers must be careful to ensure that the only place they use the materials is in the classroom (Heffernan & Wang, 2008).

Furthermore, having learning materials created for learners by a teacher who is familiar with the students' learning needs is more likely to resonate positively with the students, enhance their classroom learning, and hopefully, increase their motivation towards language learning. Also, from a teaching perspective, creating in-house materials enables teachers to offer material which learners themselves see as relevant and applicable to other situation (Ngeow, 1998). This is also reflected in earlier research on motivation. In one such study, Oxford and Shearin (1994) analysed 12 motivational theories and identified six factors that affect motivation in language learning. One of the factors highlighted was "environmental support," which is defined as the "extent of teacher and peer support, and the integration of cultural and outside-of-class support into learning experience."

In order to appeal to our young participants, the topics chosen for the mobile learning project were as topical and broad-based as possible. To capture student interest, the topics chosen were not overly taxing and included jokes and riddles. Although listening skills had never been the focus of this project, we were aware that reading accompanied by pictures and audio is always more effective than a text-only format (Fiorea, Cuevasa, & Oserb, 2003; Glenberg & Langston, 1992; Koskinen et al., 2000). Accordingly, since August 2011, all materials in our project have included both audio and visual content to support the readings. Students could then listen to or watch each reading (see essay example in Figure 1, left, and the MP4 formatted animation in Figure 1, right).

Alongside the reading text, which was usually a short story, a joke or an anecdote, two types of grammar materials were provided: grammar knowledge and grammar quizzes. In a previous e-learning program, we had discovered that most students at our university are typically weak at using nouns, the subjunctive mood, participles, and negative forms. To address these areas, the grammar interpretations sent to students focused on these items. Each grammar item interpretation was attached with a grammar quiz URL. From a project objective, the grammar knowledge delivery was a form of explicit teaching (i.e.,

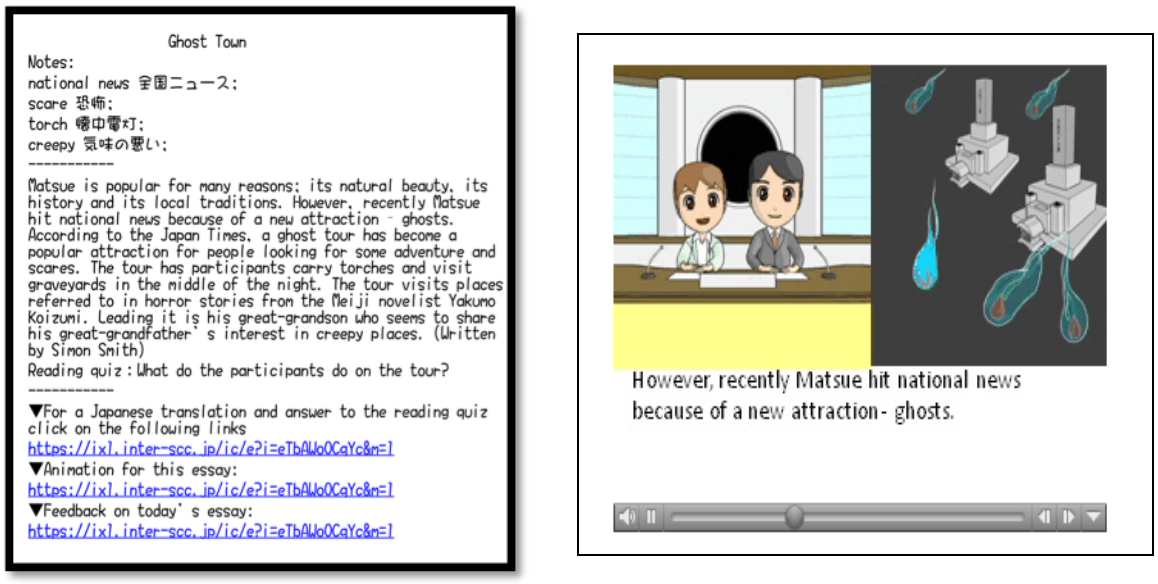

Figure 1. Mini essay (left) and an MP4 formatted animation for this mini essay (right).

pushing student learning) whereas the grammar quiz was seen as a test of their understanding (i.e., pulling student learning). Sometimes trivia associated with English grammar were added to the grammar activities in order to increase students' motivation. Because most of the readers were first-year students at the pre-intermediate level, part of the grammar section was written in Japanese (see Figure 2).

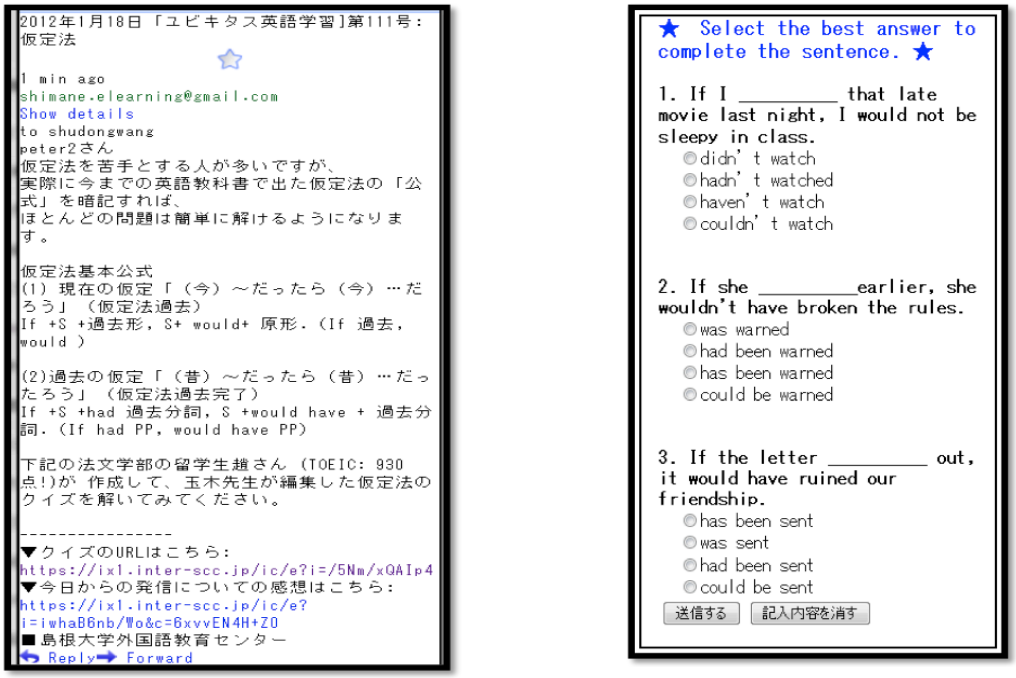

Figure 2. Grammar explanation sent via email (left) and grammar quiz (right).

Participant-Student Subscribers

Because the learning materials were mainly delivered via email, our first priority was to obtain students' email addresses. As personal information is strictly protected by Japanese law (The Cabinet Office of Japanese Government, 2005), students were under no obligation to provide teachers with their email

addresses (El-Khatib, Korba & Yee, 2003; Kimura, Komatsu, Shimagawa, Shirahase, & Sekine, 2005). Thus, after distributing handouts to every first-year student, we explained the goal of our project and the purpose of requesting their email addresses. Students were asked to register their email addresses of their own volition and were told that their email address would be used only for this project. They were also told they could opt out at any time.

Upon beginning the project, we were aware that many students might be reluctant to share their personal information with an e-learning system (Boston, 2009; Wang & Heffernan, 2010), so we consented to the use of nicknames when students registered their email addresses. In total, as of June 2012, 372 email addresses had been registered with the project. Unfortunately, not all of the registrants became permanent participants, reducing the number of active participants to 208. There were four predominant reasons for the loss of so many subscribers: (a) some students found the program unsuitable for their learning style and chose to terminate their subscription; (b) Japanese students frequently change their mobile phone email addresses in order to avoid spam emails, and some forgot to update this information with the project; (c) many students' mobile phones are pre-set by telecommunication companies to prevent receiving emails from PCs; and (d) the emails from the project server were automatically filtered to the spam folder.

The Delivery Mode of Mobile Learning Material

Once created, the reading and grammar materials were uploaded to the server. These were sent to students through the server's email system as an email in plain text with the URLs attached. The email system was set to send out 20 emails per minute in plain text to lower the possibility that the learning materials be blocked as spam or be treated as suspicious. For every reading text, a simple comprehension exercise was designed to check student understanding. Grammar quizzes were then sent via URLs attached to each grammar point review (see Figure 3). When students opened their email, the reading materials could be read as messages, so students did not need to go beyond the link provided. A comment/quiz system was used for the purpose of student-teacher interaction. All of these systems were designed or customized for mobile phones, but were also compatible with any PC. URL links contained Japanese translation notes, material rank interfaces, and grammar quizzes. Figure 4 indicates the information flow throughout the project.

ありがとうございました

回答を受け付けました。
回答番号は**1191-003534**です。お問い合せの際にご利用ください。

採点結果

	回答	正答	得点 / 配点
1. If I _____ that late movie last night, I would not be sleepy in class.			
正解	hadn't watched	(hadn't watched)	100点 / 100点
[解説]「もし昨夜映画を観ていなかったら、(今)授業中に眠くなったりしないのに。」＊「もし(過去に)～していたら、(現在)～だろう」仮定法過去完了＋仮定法過去			
2. If she _____earlier, she wouldn't have broken the rules.			
不正解	has been warned	(had been warned)	0点 / 100点
[解説]「もしも彼女があらかじめ警告を受けていたならば、ルールを破らなかっただろう。」＊「もし(過去に)～していたら、～だっただろう」			
3. If the letter _____ out, it would have ruined our friendship.			
正解	had been sent	(had been sent)	100点 / 100点
[解説]「もしもその手紙が投函されていたら、私たちの友情は台無しになっていただろう。」＊「もし(過去に)～していたら、～だっただろう」			
			合計 200点 / 300点

Figure 3. Quiz interaction with score and explanation.

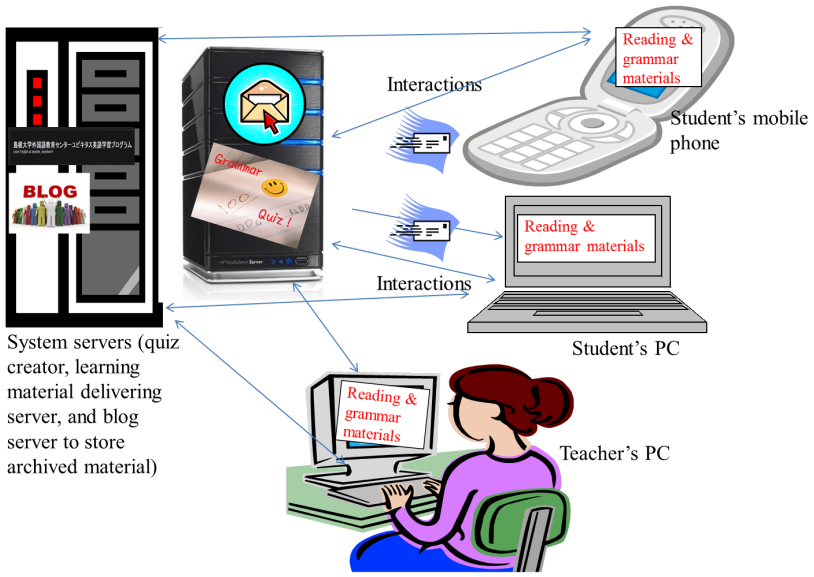

Figure 4. Technical work flow of mobile learning material delivery.

Registration for the project was always open-ended, but students who joined the project at later dates could not access earlier readings. For these students, a blog system was built to store archived material for the students to browse. We archived all materials that were sent out via emails in web format by using the open-source content management system, WordPress. The web site (http://www.shimadai-elearning.saloon.jp/keitai-eigo/) was customized for use on mobile phones. Between June 2010 and June 2013, the archived mobile phone blog site logged 68,166 page views.

Data Collection

The data from the project feedback were collected using the following methods: online surveys, server log analysis, and interviews. Three consecutive web surveys written in Japanese were conducted among the subscribers in 2010, 2011, and 2012. The data presented in this paper is from the latest survey conducted in April 2012. The survey's URL was sent by email to students and was accompanied by the survey's rationale and questions. Students were informed that their identity would remain anonymous, and furthermore, that they were under no obligation to complete the questionnaire. As the questionnaire was delivered to their mobile phones, we limited it to eight short questions. Seven were multiple-choice questions, and the last one was an open-ended question asking their general opinion about the project (see Appendix). The survey was available online for two weeks from April 2nd to April 16th. The survey questions were grouped into three categories: Questions 1, 5, 6, and 7 investigated which materials students like to read on mobile phones. Question 2 asked about the type of digital learning device that was used to receive materials. Questions 3 and 4 surveyed students' overall perceptions of the project. Half of the questions from the survey asked for the students' assessment of the learning materials. This is because according to Day and Bamfors' Expectancy and Value Model (1998), good material development is one key factor in motivating students to read in foreign languages. It is only when the materials engage the students, (i.e., easy to read, short, with interesting content) that they feel motivated to continue learning (Takase, 2003).

Fifty-six project participants answered the questionnaire (n = 56) which represents a response rate of approximately 27%. Whilst the somewhat low response rate does not automatically indicate that the survey was inaccurate or unrepresentative (Taylor, Drummond, & Strang, 1997; Holbrook, Krosnick, & Alison, 2007), data from other project records—a server data analysis and interviews—were used to

support the results from the questionnaire.

Technically, the system could not detect whether the learning materials sent in plain text via email were read or not. However, the number of clicks on the automatically generated URLs attached to the emails was recorded by the server. The system recorded who took the quiz and when the quiz was taken, as well as any score details. For the archived materials stored on the blog site, the system could also track IP addresses, as well as store the information on the type of material that was accessed.

Two types of participants were selected to be interviewed. The first type consisted of users who registered from the onset of the program until the close of the study; the second type included students who joined the program but withdrew after only a short period of participation. In total, four students—two males and two females who were all randomly chosen from those who registered with their real names—were interviewed after class on separate days. During the interview each user was asked why he or she chose to continue with or leave the project.

RESULTS

Research Question 1: The Appropriacy of the Reading and Grammar Materials

The first question asked respondents about their attitude towards the learning materials developed by their peers, referring to the learning materials developed by 10 students recruited from within the university. Out of 56 respondents, 36 (64%) said they enjoyed the essays as well as some of the grammar quizzes written by students. The remaining 20 (36%) indicated their indifference by selecting the neutral option. This is a clear indication that the majority of students welcome reading and learning materials developed by their peers.

In terms of student-created materials, we also analyzed feedback from our server logs. This was possible because for each message sent, subscribers were invited to leave comments. Whenever the learning materials were sent out, we included the author's name so that readers could identify the author of the material. On average, the learning materials developed by native English-speaking teachers received three comments each. Interestingly, this number increased on average to five when the materials were written by students (and corrected by teachers). When quizzes were created by students, the average number of students taking part in quizzes also increased from 20 to 25. Whilst the data is not statistically significant ($t = 2.33$, $p < .05$), comments from users were very positive as demonstrated below:

> This is a good try. Actually I didn't realize the essay was written by my schoolmate until I saw the author's name.

> It feels intimate to read essays written by ourselves, about ourselves and for ourselves. Can I also contribute my essays?

These comments show that mobile reading and grammar materials created by students probably increases motivation to read. Furthermore, despite not being "authentic" (i.e., published, native-English authored) texts, they were by no means regarded as inferior by students. Rather, the appeal or approval probably came from the fact that the writing comes from the students, themselves. For future developments in mobile learning materials, extensive involvement of students in mobile learning material development is worth considering.

Questions 5 and 6 were designed to examine which materials were rated the highest. English essays (41%), trivia (34%), and grammar quizzes (27%) were ranked as the most read/accessed materials. Seven percent of students surveyed ranked "all materials" as the most read, and the same percentage of students said that "none" were their most read. The results imply that rather than taking grammar quizzes, students prefer to read essays and trivia surrounding language. The fact that essays are preferred to grammar

quizzes should remind us that materials read or interacted with on mobile phones should not be too demanding.

In terms of the different essay genres, these have been ranked below in decreasing order of preference: English jokes and riddles (45%), cultural differences (30%), life/living/entertainment (27%), and topics related to the environment (12.5%) and proverbs (12.5%). Unpopular topics included English learning methodology (5%), science and technology (4%), society (4%), and politics (4%). Our findings from the ranking of essay topics demonstrate that learning through interesting materials, (i.e., English jokes and riddles), or something more esoteric, (i.e., cultural differences, or campus life) can best attract students' attention and provide stimulation for any project. Question 7 asked students to rate the suitability of the learning materials used in the project according to their own English level/needs. Sixty-three percent thought that the level of writing was suitable; whilst 37% indicated that they thought the materials were difficult. From this we can state that materials developed by teachers and peers are well suited for and viewed favorably by students.

In addition to the above information, we also looked at the access logs of our web materials using a WordPress plugin called *Visitor Map*. This took a snapshot of the daily traffic between June 1 and June 10, 2012. The number of times each essay was accessed is presented below.

Table 1. *Web Access to the Mobile Reading and Grammar Materials*.

	Topics	Accesses	Percentage
Essays	Cultural differences	76	21%
	Environment	22	6%
	Life/living/entertainment	41	11%
	English proverbs/ idioms/sayings/quotations	46	13%
	English learning techniques	16	4%
	Science and technology	5	1%
	Society	17	5%
	English jokes/riddles	62	17%
	Politics	2	1%
Grammar knowledge and quizzes		9	2%
Trivia of English (in Japanese)		69	19%
Total		365	100%

Note. The above accesses were all from Japanese IP addresses including the entries from Google search engine.

As can be seen in Table 1, essays concerning cultural differences (21% of all accesses) and English jokes/riddles remained the most popular topics among readers. Web access data confirmed students' preferences for the materials identified by the survey.

Research Question 2: The Position of Mobile Learning Devices

Question 2 asked which device each student used for receiving the learning materials. Forty-one (73%) respondents reported that they used a mobile phone. Only 14 (25%) said they used their PC's email

addresses for the project. Only one student reported using an iPad to receive the materials. The data is consistent with the email registration when recruiting subscribers for the project. Of the 372 subscribers, 279 (75%) students registered with their mobile phone, although they were told that PC email addresses were acceptable. This further illustrates the willingness and confidence that first-year students have towards using mobile phones for language learning. These results support the research findings of Thornton and Houser (2005). Furthermore, our results echo recently published figures that show a high use of mobile phones: indeed, 95.6 % of senior high school students in Japan possess mobile phones, of which 95.1% have Internet connection; of senior high school students, 75.6% use the Internet more than two hours every day (The Cabinet Office of Japanese Government, 2011). The same survey results show that first-year university students, typically 18 or 19 years old, have been using mobile phones for some years and have become adept at using them on many levels. This could explain why such a large proportion of our respondents (73%) reported that they used a mobile phone to access the learning materials.

Research Question 3: Overall Perception of Mobile Phones for Reading and Grammar

Questions 3 and 4 investigated the overall perception of the project by the students. Question 3 asked: How often do you read the learning materials? Forty students (71%) replied that they had read almost all of the materials, 11 (20%) said that they had read everything, and five (9%) indicated that although registered with the project, they had never read any of the content. Question 4 asked if the project was helpful in improving their English reading and grammar ability. Forty (71%) reported positively, saying that they thought the project, in general, was helpful in developing their reading and grammar ability.

According to our questionnaire, the project was well-received by the students. As the project was not associated with any mandatory English course, students were free to opt out or disregard any of the learning materials. In spite of this, 20% indicated that they had read all the materials. Furthermore, 71% of participants felt that their reading and grammar abilities had improved by taking part in the project.

Ideally, the progress of subscribers' reading and grammar abilities should be assessed on a yearly basis. However, as stated earlier, the purpose of this project was to provide a relaxed reading and grammar practice environment for students. We also wanted to explore the impact of delivering informal reading and grammar exercises to mobile phones. As participation was voluntary, and students were not tied to any physical classrooms, any form of assessment would be a significant challenge. Assessing mobile learning outcomes may be difficult if learners cannot be brought together into a controlled testing environment (Wang & Higgins, 2006).

Finally, Question 8 was an open-ended question inviting general comments about the project, to which 26 respondents gave comments. Most students (71%) perceived reading short essays on mobile phones as a helpful tool towards improving their reading ability. The comments listed below represent the overall perception of the program:

> I like the short essays and I thought that every essay was interesting.
>
> Although I don't always have time to read the essays, I think it is a good chance for us to be exposed to English.
>
> I am too busy to read all of the essays; however I do believe that this is a good way to come into contact with authentic English
>
> I like reading on mobile phones. Unlike reading on a PC, I can read any time, anywhere.
>
> The words in the essays are sometimes challenging but at the same time the essays are easy to understand. It is a good project!

These comments capture the students' opinion that reading on mobile phones increases their exposure to English. Participants indicated that they liked the mode of reading content delivered by phone. Interestingly, many also commented that they would prefer receiving the material in an ad hoc fashion as opposed to receiving them on specific days each week. One implication of this is that students do not want to make a commitment to study; therefore, receiving the material in a less predictable manner may provide a less formal quality to the program. Similarly many students commented favorably on the short and easy-to-understand format of the reading material. As feedback indicated that students were inclined towards topics on cultural differences, as well as jokes and proverbs, native-speaker teachers integrated grammar and vocabulary components into those topics.

Despite the popularity of the reading content, this did not extend to the grammar quizzes, which received less participation than some of the reading materials. On average, each grammar quiz had only 23 volunteer participants—roughly equating to 11% of the total number of active subscribers. In an interview with a student who was active for the whole project, we asked why he felt students were less favorable towards online quizzes. He answered:

> We are tired with so many classes and do not want to use our brains to think about quizzes after class. Taking quizzes is not like reading interesting essays; it is not enjoyable at all. In addition, our teachers are probably monitoring our performance. It would be embarrassing if I did poorly in the quiz. Therefore, unless it is made into a compulsory assignment, I don't want to do the grammar quizzes.

This remark implies that unless there is an element of compulsion to the program, students are reluctant to do anything overly demanding unless it is linked to their overall grade—even if it is delivered via mobile phones. The lesson here is that optional learning materials designed for mobile phones should not be too challenging: this may reflect the fact that students may also not have the time or the energy nor the tools to engage in study outside of class that is seen as too time-consuming.

DISCUSSION

Reading on Mobile Phones: Motivation Counts

Research suggests that on average, 76.6% of Japanese university students spend more than 30 minutes a day reading or sending messages on their mobile phones; and 79.5% spend more than 30 minutes browsing the Internet on their mobile phones (MyNavi Co. Ltd., 2012). If students were to engage in reading activities on their phone for just a small portion of this time, it could be inferred that measurable improvements in their reading ability could be attained. Given the high usage of mobile phones within the student population, it was assumed that this would translate favorably with regards to our program. However, we severely underestimated one very important factor: motivation. Whilst a significant amount of time is spent browsing or socializing on phones, that time is not likely to be easily relinquished to a less rewarding activity (phone or otherwise). Similarly, if learning of any variety is to be extended onto mobile phones, it must engage students on a level that can compete with free games and social media—a formidable challenge.

As we have noted, given the strong association between phones and gaming, motivating students to use their phone for learning is an ambitious task. This is compounded by the fact that reading in another language is one of the hardest skills to acquire, as it requires higher-level comprehension processes. Therefore, the hard work needed to gain even modest improvement is perhaps the reason why many learners find reading one of the most challenging tasks among the four skills (Ngeow, 1998). Huang (2006) recognizes that with L2 reading "learner motivation may be a concern" (p. 3), but one which should not impede the learning process. Huang also pointed out that one of the important factors to motivate reading in an L2 is that teachers are available to answer questions. This offers possibilities for

future innovations in mobile learning such as the integration of Mobile Instant Messaging.

In the case of a class activity, reading a text under a teacher's supervision is obligatory and students are required to answer any questions posed by the teacher. However, for this project, registration was voluntary, as was the reading of essays or taking quizzes. Unlike formalized class study, there were no tests or formal evaluations of the subscribers. Students who entered this project did so of their own volition and with their own agenda. This appears to have lowered the participation. Only those students who already possessed high motivation or directed their study towards a goal-related purpose such as a job or study abroad program remained very active in the project. A future challenge for this project would be how to attract new membership but, most importantly, how to maintain student motivation.

Many registered students left the project due to a lack of motivation connected to either material or extraneous factors. The activity of reading project material may in some way compete with or take away socializing or gaming time from students. Thus, firstly, an important aspect of any mobile reading project must be to devise ways to enhance the motivation for reading English content. Secondly, some form of incentive may need to be offered in order to compete with the already high demands of social networks and games on the mobile phone. We interviewed a student who participated in the project for all of 2010 but quit in 2011. Our question was: Why did you choose to join the program in the beginning and what caused you to quit? He replied:

> In the beginning I thought it was compulsory to read the essays. I also thought that some questions in the mid-term or final exams might be included in the learning materials that the project sent. However, I discovered that this was not the case. In fact the learning materials sent to my mobile had nothing to do with the academic credits. The essays are indeed interesting and informative, but just doing homework from regular English classes is enough. I don't have extra energy and time to read on my mobile phone. I also heard that many of my classmates did not join the project and they were not affected at all, so I decided to quit too.

This view may represent a majority of other students who may not want to read and practice English on their mobile phones. No matter how good the reading material is, these students will not be motivated by mobile reading unless:

1. Learning outcomes are linked with a specific course goal and/or that the students' performance is eventually evaluated or recognized through course credit.
2. Learning progress and performance are formally monitored. Students need to have assurances that they are in a social arena with their teachers or peers.
3. There is some recalibration of the material during the project to reflect the comments and feedback of students. This can be maintained through close monitoring of the server logs and comments from the students.

Reading and Grammar Learning on Mobile Phones: Technical Advantages and Security Concerns

There are many technological advantages to using mobile phones for reading and grammar learning. Materials sent via email can be stored in the receiver's inbox folder and can be retrieved and accessed at any time. Because students always carry their mobile phones, they can review the reading materials as many times as they want. With 3G and 4G technology development and Wi-Fi enabled for smart phones, the cost of connecting to the Internet is within the means of most students. The concept of mobile phone learning, although not yet prevalent, is likely to become accepted by more and more learners.

However, the disadvantages of mobile phone learning are still significant. As stated above, students are not used to reading learning materials on small screens. Taking quizzes or answering reading questions requires them to scroll up and down; interaction on mobile phones is not as easy as on PCs; and most

importantly, students view mobile phones as their private domain which should remain disconnected from formal study. The distinction is clear: many students accept the concept that learning should be done in class or on a PC, whereas mobile phones are for their personal affairs. Changing this perception may require a shift in thinking as well as teaching. Indeed, given the high ownership rate of mobile phones, it is surprising that university students rarely use the mobile phone as an educational tool. In 2012, on our registration page, we asked the following question: "Have you ever used mobile-phone for learning?" Sixty-two students (59%) who replied said they have never used their phone for learning.

Another factor obtained from the feedback is a concern about security. Japanese students are wary of clicking on any URLs that they are unfamiliar with. They fear that clicking on an unknown URL could result in spam email in the future or lead them to an untrustworthy website. In the interview with an active student, we asked her concerns about receiving the learning materials on mobile. She reported:

> Clicking an unfamiliar URL sometimes directs one to a bad site. Not only does it cause spam emails, but also there is a high risk of being connected to potentially improper sites. So most of us are very wary about clicking on any suspicious looking links.

Indeed, in Japan, Internet fraud cases are becoming a major problem, as there have been cases whereby people have unknowingly clicked on a suspicious web link at work or in the public domain, with embarrassing consequences. In computer literacy courses high school and university students are repeatedly told not to click on any URLs that they are unsure of as computer viruses and personal information leaks may follow. For such reasons, concerns about security are regarded as a significant reason for low participation on grammar quizzes.

The discussion above answers Research Question 4: Students do have privacy and security concerns when they learn via mobile phones.

CONCLUSION

Although quantitative assessments were not carried out on a yearly basis, objective data were collected throughout the project in various ways: through registration records, quiz results, comments and the learning history stored on the server. The data combined with the results of interviews lead to the following conclusions: in general, mobile phone-assisted learning is perceived positively by students as an effective method for improving reading and grammar ability. But for learning to take place, the material must engage the learner, without being too demanding. For young university students, reading topics that focus on cultural differences and student life are the most relevant, as are jokes, and entertaining stories—which are regular favorites. Items such as grammar quizzes need to be kept to a minimum to avoid the perception of being seen as study. Security is always a big concern for mobile learners. Before launching a mobile learning project, Internet security should be carefully considered. This means that a secure learning platform, a secure mode for delivering learning materials, and a secure way to monitor students' progress should be in place. Our study also instructs us of the necessity to empower the students in some form of material development, as students themselves are best placed for knowing their own learning preferences. Additionally, mobile learning content is destined to be short and segmented.

Our findings also highlight the importance of respecting a student's right to privacy. For a project to have any significant impact on learning outcomes, it must be highly responsive to any feedback—positive or negative. Finally, in order to compete with the ubiquity of games and social media, it may be necessary to offer students some form of inducement or incentive. We fully believe however, that having incentives is not the panacea, as learning should always bring its own reward. However, linking mobile learning to a formal course evaluation may be a crucial step to improving the efficacy of mobile learning.

We hope that this study will help focus the attention of other mobile learning practitioners to embrace a mobile phone learning culture. By working as partners with students, educational institutions can build an effective reading and grammar mobile program that places students at the forefront of learning.

RESEARCH LIMATIONS AND FUTURE WORK

Whilst our conclusions are based on subjective interpretation (surveys and interviews) and objective data (server logs and grammar quiz results), we are aware that this research has some limitations. Firstly, the project consists predominantly of first-year undergraduates, which may not fully reflect the learning style and mobile learning preferences of all undergraduates. Secondly, the measurement of reading and grammar learning efficacy could have undergone more rigorous experimental assessment. Instead, we based our results on students' perceptions and server logs, which may not be as reliable indicators of improvement as actual tests. Thirdly, due to copyright concerns, this project used in-house materials as opposed to authentic or abridged authentic texts. To reflect the different preferences of students, it might be better to use a mix of authentic and in-house material.

In answer to these limitations we plan to extend our project to include senior students and integrate the use of authentic learning materials. From 2013, all students' learning outcomes will be evaluated through regular tests which will be incorporated into our data for further analysis.

APPENDIX. Survey on Reading and Grammar Study on Mobile Phones (*n* = 56)

Options	Responses	%
1. Between November 2011 and March 2012, 30 topics were developed by students. What did you think of these materials?		
Good	36	64.3%
Neutral	20	35.7%
Poor	0	0
Other	0	0
2. On what type of device did you usually receive the learning materials for the project?		
Ordinary model of mobile phone	25	44.6%
Smart phone	16	28.6%
PC	14	25.0%
Other	1	1.8%
3. How often did you read the learning materials?		
All the time	11	19.6%
Sometimes	40	71.4%
Never	5	8.9%
4. Overall, do you think that this project was helpful in improving your reading and grammar ability?		
Very helpful	5	8.9%
Somewhat helpful	35	62.5%
Neutral	14	25.0%
Not very helpful	1	1.8%
Not helpful at all	1	1.8%
5. Which type of learning materials did you prefer?		
Essays	23	41.1%
Grammar quizzes	15	26.8%
Trivia of English language	19	33.9%
All types	7.1%	4
None	7.1%	4
6. From the essays you read, what were your favorite topics?		
Environment	7	12.5%
Life/living/ entertainment	15	26.8%
Cultural differences	17	30.4%
English proverbs/ idioms/ sayings/ quotations	7	12.5%
English learning methodology	3	5.4%
Science and technology	2	3.6%
Society	2	3.6%
Politics	2	3.6%
English jokes/riddles	25	1.8%
7. Were the learning materials difficult?		
Very difficult	2	3.6%
Somewhat difficult	19	33.9%
8. Any comments about the project are welcome.		

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